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METEOROLOGY OF INDIAN SEAS.

Meteorological Atlas of the Indian Seas and the North Indian Ocean. Prepared chiefly by W. L. Dallas, under the direction of Dr. Gilbert T. Walker. Pp. viii+36 charts. (Simla: Published by the Meteorological Department of the Government of India, 1908.) Price 17s. 6d. net.

ALTHOUGH steam has almost entirely superseded sail for the propelling of ships, there nevertheless appears to be a steadily increasing desire on the part of sailors for accurate information relating to marine meteorology, and recognition of its importance in the interests of navigation.

A meteorological atlas, recently published by the Meteorological Department of the Government of India, should therefore be welcomed by seamen who navigate the ocean areas of which it treats.

This atlas is composed of thirty-six charts, printed in colours, beautifully finished, and accompanied with descriptive remarks. Twelve of these are designed to show the average conditions of atmospheric pressure, wind, and sea-surface currents, or "sea currents," as they are termed in this volume. The value of the charts would have been enhanced if results of air-temperature observations had been added. The effect of a prevailing wind upon mean temperature, and the relation between temperature and pressure are problems of interest to students of meteorology.

Nine charts show the monthly tracks of important cyclones, and cyclonic storms, over the Arabian Sea and Bay of Bengal; and fifteen charts the conditions prevailing, and the changes taking place, during the existence of typical storms in those areas.

The charts refer to an area embraced by the parallels of 30° N. and 12° S. lat., and the meridians of 40° E. and 100° E. long. The monthly charts of barometric pressure, wind direction, and force exhibit mean results of 8 a.m. observations (local time) for areas of 4° of latitude and 4° of longitude.

Pressure is shown in red by isobars, but is also given in tenths and hundredths of an inch, in the left-hand upper corner of each 4° square. Wind direction is indicated by an arrow in black, and wind force (by Beaufort scale) by figures at the tail of each arrow, which denote the mean force for the whole of the 4° square to which the arrow refers. The flow of the currents is shown, in blue, by wavy arrows, and the velocity in nautical miles per 24 hours is given, in most cases by figures attached.

In the directions for using the pressure data a table is given for the purpose of reducing readings of the barometer, at any hour of the day, to that of 8 a.m. For the sailor this is a useful table.

A defect in this volume is the absence of any information with respect to the number of observations upon which the results for each meteorological element is based. Wind direction, for instance, may be based on 2, 200, or more observations; they may be all for one year, or may be spread over a number

of years; they may be recorded by one ship, or by many ships.

The wind arrows shown on the first twelve charts are said to represent the mean direction of the wind, but the exact meaning of the term "mean direction" is not stated. It may be the prevailing direction that is meant, or it may be the resultant wind. In any case a single wind direction in each square, either for the purposes of scientific investigation or for the uses of the navigator, is inadequate for the representation of wind distribution, even where the wind's direction is most constant. Information relating to wind frequency, in order to be of value to the sailor, should deal with the percentage of frequency of all winds within definite areas; and for the Indian Ocean, Bay of Bengal, and Arabian Sea this is essential. In order to show the march of the south-west monsoon from east to west at its commencement, the gradual changes from north-east and north-west monsoons to south-west monsoon, and the reverse, and to exhibit clearly the northern limit of the south-east trade wind, month by month, nothing short of a complete wind rose will suffice.

The wind directions and forces have been, it is stated, extracted as they stood in the ships' log-books. This may be regarded as sufficiently accurate in connection with wind direction, as the magnetic variation over the area treated is small, and the deviation of ships' compasses is now usually kept within negligible limits; but as regards wind forces it is otherwise. The objections in this respect to the method adopted are, however, recognised, and are alluded to as follows:—

"They may represent the ordinary force of the wind, over the square to which they refer, or they may arise as the average of winds of widely varying velocities."

To meet this difficulty the sailor is referred to the remarks for the month, given in the pages opposite the charts; but it seems doubtful whether these remarks will help the sailor much in all cases, as only the most general information is given in this connection. Owing to the absence of information as to the number of observations on which each wind arrow is based, it is not possible to compare the direction and force of the wind in one square with those of another, or to estimate the chances of experiencing any wind other than the mean wind in any particular square.

The information relating to surface currents has been copied, it is stated, from the "Monthly Current Charts for the Indian Ocean," issued by the Hydrographic Department of the Admiralty. The charts dealing with the track of storms, and those illustrating typical storms in the Arabian Sea and Bay of Bengal, in different seasons of the year, should prove exceedingly valuable to the sailor, especially the former.

It is to be regretted that in this work the term "cyclone," used by most meteorologists to define a characteristic distribution of pressure and wind, has been employed instead to express the force of the wind in a tropical revolving storm. The term was originally adopted by Piddington in his "Sailors' Horn Book"

(1848), when, in reference to the classification of winds, he says:—

“I suggest that we might for this last class of circular, or highly curved winds, adopt the term ‘cyclone,’ from the Greek *κυκλος* (which signifies, amongst other things, the coil of a snake), as neither affirming the circle to be a true one, though the circuit may be complete, yet expressing sufficiently the tendency to circular motion in these meteors.”

In the volume under notice the definitions given in this connection are as follow:—

“A cyclonic circulation in which the winds do not exceed force 10 is termed a ‘cyclonic storm,’ while a circulation in which the winds are of hurricane force, 11 to 12, is called a ‘cyclone.’”

According to the Beaufort scale, storm force is expressed by the number 11; while employing this scale, is it not illogical to define a circulation, in which the winds do not exceed 10, as a “cyclonic storm”?

The copious remarks which accompany the charts are interesting and instructive, and add greatly to the worth of the volume. M. W. C. H.

A TEXT-BOOK OF TROPICAL MEDICINE.

Tropical Medicine, Hygiene, and Parasitology. A Handbook for Practitioners and Students. By Gilbert E. Brooke. Pp. xvi+498. (London: Charles Griffin and Co., Ltd., 1908.) Price 12s. 6d. net.

THIS is a volume of the well-known medical pocket-book series, and corresponds in size and binding to Davies's “Handbook of Hygiene.” It is a book of five hundred pages, and is divided into four sections.

The first section deals with the hygiene of the tropics, and discusses climate, food, exercise, clothing, hygiene of the mouth, pregnancy, and infant feeding in the tropics. The information and advice given in this section are useful and practical. For example, in regard to alcohol the author is of opinion that while it is not absolutely necessary for a man in any climate, a small quantity well diluted is often beneficial in the tropics. Most experienced travellers will agree with this, since the debility and consequent want of appetite brought about by tropical heat renders the stimulating effect of alcohol more necessary in warm than in temperate climates. Three ounces of whisky in the twenty-four hours is stated by the author to be the maximum which should be taken by a man in health. This will be thought by many dwellers in the tropics to be a counsel of perfection, but certainly the advice is sound, practical, and necessary. In regard to mosquito-bite prophylaxis, Dr. Brooke recommends various external applications; but surely experience teaches that these are of little or no practical use. The best protection is a good mosquito net. The author, speaking of mosquito nets, rightly says that the net in common use is a snare and a delusion. The best plan certainly is to have a permanent mosquito-proof room, which can, if necessary, be rigged up with ordinary mosquito-netting at the cost of a few shillings. In this room, or part of a room, there should only be a bed, a table, and a lamp. If one has to

dine out where mosquitoes are numerous, a pair of Wellington boots may be found more productive of a calm, equable mind than the ordinary silk socks and pumps of fashion. Dr. Brooke seems to be of opinion that tropical medicine is something quite different from the medicine taught in the schools, and that no one can pretend to treat these diseases unless he has had special training. There seems to be too much made of this nowadays. Surely with a five years' curriculum it should be possible to teach a student the art of medicine sufficiently thoroughly to enable him to recognise a new disease when he comes in contact with it for the first time! A carpenter is not supposed to have made everything during his apprenticeship. He is taught the principles of his trade, and afterwards applies them to his daily work, whatever it may be.

The second section deals with medico-biology, and includes the classification of animal and vegetable parasites, notes on tapeworms, nematodes, mosquitoes, fleas, ticks, and snakes. Here also a great deal of useful information is compressed into some eighty pages; and there are several plates giving figures of the ova, larvæ, and worms most commonly met with. Of course, as is unavoidable in the compilation of a text-book, more or less trivial errors are apt to creep in, such as the name *Streptococcus pyogenes aureus*, or the assertion that *S. scarlatinae* is the cause of scarlet fever, or that the tsetse-flies act as hosts in the spread of *Piroplasma bigeminum*, and such-like slips of the pen; but these do not really take away from the general usefulness of the section.

The third section is devoted to the description of the etiology, symptoms, and treatment of tropical diseases. These are arranged alphabetically, which arrangement has little to commend it, especially as the author has tried his hand at nomenclature and evolved two new names for sun-stroke, Phœbism and Diathermasia! On the whole, the descriptions of the various diseases are clearly given and well illustrated. In a rapidly progressing subject such as that of tropical diseases is at present, it is scarcely possible for a text-book to be quite up-to-date. In the description of dengue, for example, there is no notice of the recent important work which has been done in the etiology of this disease. In Malta fever it is stated that the method of transmission of the disease is uncertain. That is not so. This was clearly established two years ago, when it was shown that Malta fever is carried from infected goats to man through the medium of milk. Since goats' milk was banished from the dietary this fever has practically disappeared from the English garrison in Malta. This fact should be placed in the forefront of the description, and everything else made subsidiary to it. Again, what is the use at the present day of writing that Manson considers the weight of evidence to point to its diffusion by air-currents rather than by food and water? This is an old speculation which ought to be decently buried and forgotten. Further, more than half a page, in the account of the same fever, is devoted to describing some experiments carried out by two naval surgeons. These experiments ought not